

What is claimed is:

[Claim 1] A formation evaluation system for a downhole tool positionable in a wellbore penetrating a subterranean formation, the formation having a virgin fluid and a contaminated fluid therein, comprising:

at least two inlets for receiving the fluids from the formation;

at least one evaluation flowline fluidly connected to at least one of the at least two inlets for passage of the virgin fluid into the downhole tool;

at least one cleanup flowline fluidly connected to at least one of the at least two inlets for passage of the contaminated fluid into the downhole tool;

at least one fluid circuit fluidly connected to one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof for selectively drawing fluid therein;

at least one fluid connector for selectively establishing a fluid connection between the at least one evaluation flowline and the at least one cleanup flowline; and

at least one sensor for measuring downhole parameters in one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 2] The formation evaluation system of claim 1 wherein the at least one fluid connector is adapted to one of pass fluid from an upstream portion of the at least one evaluation flowline to a downstream portion of the at least one cleanup flowline, pass fluid from an upstream portion of the at least one cleanup flowline to a downstream portion of the at least one sample flowline and combinations thereof.

[Claim 3] The formation evaluation system of claim 1 wherein the at least one fluid connector is connected to the flowlines at a position upstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 4] The formation evaluation system of claim 3 wherein the at least one fluid connector is connected to the flowlines at a position downstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 5] The formation evaluation system of claim 1 wherein the at least one fluid connector is connected to the flowlines at a position downstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 6] The formation evaluation system of claim 1 further comprising at least one equalization valve extending from one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof for fluidly connecting the wellbore thereto.

[Claim 7] The formation evaluation system of claim 1 wherein the at least one fluid circuit comprises at least one pump, at least one sample chamber and at least one valve for selectively drawing the fluid through the downhole tool.

[Claim 8] The formation evaluation system of claim 7 wherein at least a portion of the fluid passing into the at least one fluid circuit is dumped to the borehole.

[Claim 9] The formation evaluation system of claim 7 wherein at least a portion of the fluid passing into the at least one fluid circuit is collected in the at least one sample chamber.

[Claim 10] The formation evaluation system of claim 7 wherein the fluid circuit comprises a plurality of pumps fluidly connected to the flowlines.

[Claim 11] The formation evaluation system of claim 7 wherein the at least one pump is adapted to pump fluid in at least one of the flowlines into the borehole.

[Claim 12] The formation evaluation system of claim 7 wherein the at least one pump is adapted to pump fluid into the at least one sample chamber.

[Claim 13] The formation evaluation system of claim 7 wherein the at least one pump is adapted to pump a buffer fluid from a chamber of the at least one sample chamber.

[Claim 14] The formation evaluation system of claim 7 wherein the at least one valve is positioned along a portion of the at least one fluid circuit to selectively permit the flow of fluid through portions thereof.

[Claim 15] The formation evaluation tool of claim 1 wherein the at least one sensor is adapted to measure properties of the fluid in at least one of the evaluation flowline, the cleanup flowline and combinations thereof.

[Claim 16] The formation evaluation system of claim 1 further comprising at least one pretest piston operatively connected to one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 17] The formation evaluation system of claim 1 further comprising at least one isolation valve for selectively permitting the flow of fluid through one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 18] The formation evaluation system of claim 1 wherein the system is positioned in a module operatively connectable to the downhole tool.

[Claim 19] A formation evaluation tool positionable in a wellbore penetrating a subterranean formation, the formation having a virgin fluid and a contaminated fluid therein, comprising:

a fluid communication device extendable from the housing for sealing engagement with a wall of the wellbore, the fluid communication device having at least two inlets for receiving the fluids from the formation;

at least one evaluation flowline positioned in the housing and fluidly connected to at least one of the at least two inlets for passage of the virgin fluid into the downhole tool;

at least one cleanup flowline fluidly connected to at least one of the at least two inlets for passage of the contaminated fluid into the downhole tool;

at least one fluid circuit fluidly connected to one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof for selectively drawing fluid therein;

at least one fluid connector for selectively establishing a fluid connection between the at least one evaluation flowline and the at least one cleanup flowline; and

at least one sensor for measuring downhole parameters in one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 20] The formation evaluation tool of claim 19 wherein the at least one fluid connector is adapted to one of pass fluid from an upstream portion of the at least one evaluation flowline to a downstream portion of the at least one cleanup flowline, pass fluid

from an upstream portion of the at least one cleanup flowline to a downstream portion of the at least one sample flowline and combinations thereof.

[Claim 21] The formation evaluation tool of claim 19 wherein the at least one fluid connector is connected to the flowlines at a position upstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 22] The formation evaluation tool of claim 21 wherein the at least one fluid connector is connected to the flowlines at a position downstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 23] The formation evaluation tool of claim 19 wherein the at least one fluid connector is connected to the flowlines at a position downstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 24] The formation evaluation tool of claim 19 further comprising at least one equalization valve extending from one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof for fluidly connecting the wellbore thereto.

[Claim 25] The formation evaluation tool of claim 19 wherein the at least one fluid circuit comprises at least one pump, at least one sample chamber and at least one valve for selectively drawing the fluid through the downhole tool.

[Claim 26] The formation evaluation tool of claim 25 wherein at least a portion of the fluid passing into the at least one fluid circuit is dumped to the borehole.

[Claim 27] The formation evaluation tool of claim 25 wherein at least a portion of the fluid passing into the at least one fluid circuit is collected in the at least one sample chamber.

[Claim 28] The formation evaluation tool of claim 25 wherein the fluid circuit comprises a plurality of pumps fluidly connected to the flowlines.

[Claim 29] The formation evaluation tool of claim 25 wherein the at least one pump is adapted to pump fluid in at least one of the flowlines into the borehole.

[Claim 30] The formation evaluation tool of claim 25 wherein the at least one pump is adapted to pump fluid into the at least one sample chamber.

[Claim 31] The formation evaluation tool of claim 25 wherein the at least one pump is adapted to pump a buffer fluid from a chamber of the at least one sample chamber.

[Claim 32] The formation evaluation tool of claim 25 wherein the at least one valve is positioned along a portion of the at least one fluid circuit to selectively permit the flow of fluid through portions thereof.

[Claim 33] The formation evaluation tool of claim 19 wherein the at least one sensor is adapted to measure properties of the fluid in at least one of the evaluation flowline, the cleanup flowline and combinations thereof.

[Claim 34] The formation evaluation tool of claim 19 further comprising at least one pretest piston operatively connected to one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 35] The formation evaluation tool of claim 19 further comprising at least one isolation valve for selectively permitting the flow of fluid through one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 36] The formation evaluation tool of claim 19 wherein at least a portion of the downhole tool is modular.

[Claim 37] The formation evaluation tool of claim 19 wherein the downhole tool is one of wireline, coiled tubing, drilling and combinations thereof.

[Claim 38] The formation evaluation tool of claim 19 wherein the fluid communication device is one of a probe, dual packers and combinations thereof.

[Claim 39] A method of evaluating a subterranean formation, the formation having a virgin fluid and a contaminated fluid therein, comprising:

positioning a downhole tool in a wellbore penetrating the formation, the downhole tool having at least two inlets, the at least two inlets adapted to draw the fluids into at least one evaluation flowline and at least one cleanup flowline in the downhole tool;
selectively drawing the fluids into one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof;
selectively establishing a fluid connection between the at least one evaluation flowline and the at least one cleanup flowline; and
measuring downhole parameters of the fluids in one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 40] The method of claim 39 further comprising passing the fluids through a fluid circuit.

[Claim 41] The method of claim 40 wherein the fluid is pumped into the fluid circuit by at least one pump.

[Claim 42] The method of claim 40 wherein at least a portion of the fluids is diverted into at least one sample chamber.

[Claim 43] The method of claim 40 wherein at least a portion of the fluids is diverted into the borehole.

[Claim 44] The method of claim 40 wherein the step of selectively establishing a fluid connection comprises one of passing a fluid from an upstream portion of the at least one evaluation flowline to a downstream portion of the at least one cleanup flowline, passing fluid from an upstream portion of the at least one cleanup flowline to a downstream portion of the at least one evaluation flowline and combinations thereof.

[Claim 45] The method of claim 40 wherein the step of selectively establishing a fluid connector comprises connecting the flowlines at a position upstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 46] The method of claim 45 wherein the step of measuring comprises measuring one of pressure, permeability, mobility and combinations thereof of the formation.

[Claim 47] The method of claim 40 wherein the step of selectively establishing a fluid connector comprises connecting the flowlines at a position downstream of one of an evaluation flowline shutoff valve, a cleanup flowline shutoff valve and combinations thereof.

[Claim 48] The method of claim 47 wherein the downhole tool further comprises a plurality of fluid circuits connected to at least one of the flowlines downstream of the fluid connector, and wherein fluid is passed between the plurality of fluid circuits.

[Claim 49] The method of claim 40 further comprising selectively establishing fluid communication between the wellbore and one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 50] The method of claim 40 further comprising analyzing the measured downhole parameters.

[Claim 51] The method of claim 50 wherein the downhole parameters of the flowlines are compared.

[Claim 52] The method of claim 50 wherein the measured downhole parameter is a differential pressure between the at least one evaluation and at least one cleanup flowline.

[Claim 53] The method of claim 47 wherein the downhole tool further comprises a plurality of fluid circuits connected to at least one of the flowlines, each fluid circuit having at least one pump, and wherein the step of drawing comprises selectively pumping the fluids into one of the at least one evaluation flowline, the at least one cleanup flowline and combinations thereof.

[Claim 54] The method of claim 53, wherein the pumps are selectively activated to prevent the flow of contaminated fluid into the evaluation flowline.

[Claim 55] The method of claim 54 further comprising pumping fluid from the evaluation flowline into at least one sample chamber.

[Claim 56] A method of drawing fluid into a downhole tool, the downhole tool positionable in a wellbore penetrating a formation having a virgin fluid and a contaminated fluid therein, comprising: positioning a fluid communication device of the downhole tool in sealing engagement with a wall of the wellbore;

establishing fluid communication between at least one evaluation flowline of the fluid communication device and the formation;
establishing fluid communication between at least one cleanup flowline of the fluid communication device and the formation;
pumping fluid into the at least one cleanup flowline at a cleanup pump rate;
pumping fluid into the at least one evaluation flowline at an evaluation pump rate;
selectively altering one of the cleanup pump rate, the evaluation pump rate and combinations thereof for a discrete time interval; and
performing formation evaluation of the fluid in one of the evaluation flowline, the cleanup flowline and combinations thereof after the time interval.

[Claim 57] The method of claim 56 further comprising drawing fluid from the evaluation flowline into a sample chamber.

[Claim 58] The method of claim 57 wherein fluid is drawn into the sample chamber when the evaluation pump rate is less than the cleanup pump rate.

[Claim 59] The method of claim 56 wherein the step of selectively altering comprises:

reducing the evaluation pump rate relative to the cleanup pump rate;
reducing the cleanup flow rate to the evaluation pump rate; and
increasing the cleanup flow rate.

[Claim 60] The method of claim 59 further comprising d) increasing the evaluation pump rate.

[Claim 61] The method of claim 60 further comprising drawing fluid from the evaluation flowline into a sample chamber during step d).

[Claim 62] The method of claim 61 further comprising opening a valve to divert fluid from the evaluation flowline to the sample chamber after step b).

[Claim 63] The method of claim 62 further comprising closing the valve at one of during step d) and after step d).

[Claim 64] The method of claim 56 wherein the rates are one of synchronized, unsynchronized and combinations thereof.